

210400  
Shaughnessey No.

EEB REVIEW

Date: In: 10-17-88

Out: 01-10-89

FILE OR REG. NO. 241-EUP-REN

PETITION OR EXP. NO. \_\_\_\_\_

DATE OF SUBMISSION 08-19-88

DATE RECEIVED BY EFED 10-12-89

RD REQUESTED COMPLETION DATA 01-02-89

EEB ESTIMATED COMPLETION DATE 01-02-89

RD ACTION CODE/TYPE OF REVIEW 700

TYPE PRODUCTS(S): Hybridizing Agent

DATA ACCESSION NO(S). 408064-11

PRODUCT MANAGER NO. J. Yowell (25)

PRODUCT NAME(S) AC-303,358 (Chembred®)

COMPANY NAME American Cyanamid

SUBMISSION PURPOSE Proposed EUP for cotton

Shaughnessey No.

Chemical and Formulation

% A.I.





UNITED STATES ENVIRONMENTAL PROTECTION AGENCY  
WASHINGTON, D.C. 20460

MEMORANDUM

OFFICE OF  
PESTICIDES AND TOXIC SUBSTANCES

SUBJECT: Review of Experimental Use Permit  
and Daphnid toxicity study for  
AC-303,358 Hybridizing Agent (Chembred®)

FROM: James Akerman, Chief  
Ecological Effects Branch  
Hazard Evaluation Division (TS-769C)

TO: R. Taylor, Product Manager 25  
Registration Division

American Cyanamid Corporation has requested an Experimental Use Permit (EUP) for their product AC-303,358 to be applied by ground equipment to cotton. Chembred applied by foliar spray during the growing season, induces selective sterility in male parts of the cotton flower while female fertility is unaffected. Thus, this mechanism offers a practical technique for the hybridization of cotton. The product related objectives of the proposed experimental use permit program are to evaluate the potential of AC 303,358 as a chemical hybridizing agent for use on the wide range of cotton varieties, by investigating varietal line susceptibility, application rates and timing.

In support of the application for the experimental use permit, American Cyanamid has also submitted a daphnid acute toxicity study. Our review of the daphnid study indicates that the study is scientifically sound and may be used in a risk assessment.

Assessment of the Experimental Use Permit

The Ecological Effects Branch has reviewed the proposed Experimental Use Permit for the use of Chembred® on cotton. In our assessment, the low toxicity is not expected to result in a hazard to non-target species.

# ECOLOGICAL EFFECTS BRANCH REVIEW

## Proposed Experimental Use Permit

for

AC-303,358 Hybridizing Agent (Chembred®)

### 100 Submission Purpose and Label Information

#### 100.1 General Information

American Cyanamid Corporation has requested an Experimental Use Permit (EUP) for their product AC-303,358 to be applied by ground equipment to cotton. Chembred applied foliarly during the growing season, induces selective sterility in male parts of the cotton flower while female fertility is unaffected. Thus, this mechanism offers a practical technique for the hybridization of cotton. The product related objectives of the proposed experimental use permit program are to evaluate the potential of AC 303,358 as a chemical hybridizing agent for use on the wide range of cotton varieties, by investigating varietal line susceptibility, application rates and timing.

#### 100.2 Formulation Information

AC-303,358 (Chembred®)

Active Ingredient:

DICA (3,4-dichloro-5-isothiazole carboxylic acid)..... 33.6%

Inert Ingredients: ..... 66.4 (28.2% acid equivalent to 3 lbs per gallon)

#### 100.3 Application Methods, Directions, Rates

##### 1. States, Amounts, and Acreage

| <u>State</u>      | <u>Acres/ Lbs. active ingredient</u> |
|-------------------|--------------------------------------|
| AR (Maricopa Co.) | 1989: 100 A / 180 lbs a.e.           |
|                   | 1990: 250 A / 450 lbs a.e.           |
| <hr/>             |                                      |
| Totals:           | 350 A / 630 lbs a.e.                 |

## 2. Directions for Application

DICA will be applied at a rate of 0.1 to 0.3 lb acid equivalent per acre at approximately 10-12 day intervals by ground equipment. The maximum cumulative application per season is 1.8 lb a.e./Acre. The proposed permit is for two years.

### 100.4 Target Organisms

The target organism is the male cotton plant.

### 100.5 Environmental Hazard Precautionary Labeling

Do not apply directly to water or wetlands (swamps, bogs, marshes, and potholes). Do not contaminate water by cleaning of equipment or disposal of wastes.

## 101 Hazard Assessment

### 101.1 Discussion

The test product is known as Chembred®, the active ingredient is called DICA. The Ecological Effects Branch has previously reviewed experimental use permits for this chemical, and, based upon the then available data and proposed use patterns, concluded that minimal hazards to non-target organisms would occur. As compared to the previous application for an EUP, the present proposal indicates a lowered rate of application, and reduced acreage.

DICA is stable to hydrolysis(>30 d), and aerobic and anaerobic degradation (> 1 yr). Soil photolysis is slow with a half-life of 101 days. The chemical has a low potential for soil adsorption.

### 101.2 Likelihood of Adverse Effects to Nontarget Organisms

#### Terrestrial Species

DICA, technical grade active ingredient, is practically non-toxic to honey bees (>351 µg/bee), and is slightly toxic to practically non-toxic to birds:

|                |      |            |
|----------------|------|------------|
| mallard duck   | LC50 | >5620ppm   |
| bobwhite quail | LC50 | >5620ppm   |
|                | LD50 | 1438 mg/kg |

With a seasonal maximum application of 1.8 Lbs ae/A to cotton fields, the residues would range from 450ppm on short range grass to 13 ppm on fruits. These values are much less than the above LC50 values. Thus, the proposed EUP is not anticipated to pose an acute or dietary risk to birds. The Ecological Effects Branch has no toxicity information on which to base a hazard assessment for other terrestrial animals.

#### Aquatic Species

DICA, technical grade active ingredient, is practically non-toxic to aquatic species also:

| <u>Species</u> | <u>LC50</u> |
|----------------|-------------|
| daphnids       | >180 ppm    |
| bluegill       | >8000 ppm   |
| rainbow trout  | >4000 ppm   |

The seasonal cumulative maximum of DICA directly applied to a one acre pond 0.5 feet deep would have a concentration of 1280 ppb. This worst case scenario is not anticipated to cause a hazard to non-target aquatic species.

Because this chemical may act as a herbicide, we must also assume that it is toxic to a variety of plants. No studies on the effects of DICA on the growth and reproduction of aquatic plants are on file.

#### **101.3 Endangered Species Considerations**

Adverse effects to endangered species are not expected, because the threshold of concern for endangered species has not been exceeded (i.e., the EEC is  $\ll 1/20$  the LC50) for even worse case scenarios.

#### **101.4 Adequacy of Toxicity Data**


The data on file satisfy the requirements to support approval of this EUP. However, no data are on file that document the effects of DICA on plants.

#### **101.5 Adequacy of Environmental Hazard Precautionary Labeling**

The precautionary label appears adequate.

## 102. Conclusions


The Ecological Effects Branch has reviewed the proposed Experimental Use Permit for the use of Chembred® on cotton. In our assessment, the low toxicity is not expected to result in a hazard to non-target species.

 9 Jan 1989

David Johnson, Fishery Biologist

 1/16/89

Harry Craven, Head Section 4

 1. 10. 89

James Akerman, Chief  
Ecological Effects Branch  
Hazard Evaluation Division (TS-769C)

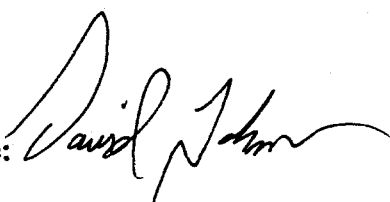
## DATA EVALUATION RECORD

1. CHEMICAL: AC-303,358 (Chembred®) SN: 210400
2. TEST MATERIAL: TGAI, 97% active ingredient
3. STUDY/ACTION TYPE: Acute Toxicity on Freshwater Invertebrate species: Daphnia magna
4. STUDY IDENTIFICATION:

Forbis, A.D. 1987. Acute toxicity of TD 2073 to Daphnia magna. Analytical Biochemistry Laboratories, Columbia, MO. Submitted by American Cyanamid Corporation, Princeton, NJ. Assession number: 408064-11.

5. REVIEWED BY:

David Johnson, Ph.D.  
Fishery Biologist

Signature: 

Date: 6 Jan 1989

6. APPROVED BY:

Henry Craven, Head Section 4  
Ecological Effects Branch  
Hazard Evaluation Division

Signature: 

Date: 1/10/89

7. CONCLUSIONS:

This study is scientifically sound and is acceptable for use in hazard assessments. These data indicate that AC-303,358 is practically non-toxic to daphnids.

8. RECOMMENDATION: N/A

9. BACKGROUND: N/A

10. DISCUSSION OF INDIVIDUAL STUDIES OR TESTS: N/A

11. METHODS AND MATERIALS:

Species. Daphnia magna

Size/Age/Physical Condition. Daphnids less than 24h in age were selected from an established culture.

Source. The Daphnids were cultured from laboratory stock.

Food. Prior to testing, the Daphnids were fed Tetramin.

Test water

Temperature:  $20 \pm 1^\circ\text{C}$

Water source and chemistry: well water.

The properties of the water are: Hardness- 270-278mg/L  $\text{CaCO}_3$ , pH- 8

Aeration: Test solutions were not aerated.

Solvent: acetone

Test System.

Vessel Size/Volume: 200ml/300ml of test solution

Vessel Construction: Glass

Photoperiod: 16h-light/8h-dark

Number of Daphnids/concentration. 10/vessel x 2reps =20

Test Levels: nominal: 10, 18, 32, 56, 100, 180 mg/L

Toxic signs. mortality, inability to swim

Statistical analysis.

The Stephan's program was used to estimate the LC50 and confidence interval.

12. REPORTED RESULTS:

Chemical analysis of dilution water included

Raw data

The raw data were included with the study report.

Analysis of Test Concentrations

Chemical analyses of the test concentrations were not performed.

13. STUDY AUTHOR'S CONCLUSIONS/QUALITY ASSURANCE MEASURES:

48h EC50(95%CL): >180 mg/L      Slope: not specified  
NOEL: 48h EC0: 180 mg/L

24h EC50: not detected

14. REVIEWER'S DISCUSSION AND INTERPRETATION OF THE STUDY:

A. Test Procedure.

This study was performed under conditions that generally comply with current Guideline standards.

B. Statistical Analysis.

EEB agrees with the statistical method. The study author's calculations match the reviewer's.

C. Results/Discussion.

The study is judged to be scientifically sound and acceptable for use in a hazard assessment.

D. Adequacy of the Study.

1. Category: core

2. Rationale: N/A

3. Remedy: N/A

15. COMPLETION OF ONE LINER 06 January 1989